Navy Case No. 96105

The Claims

What is claimed is:

1. An optical apparatus comprising:

a plurality of optical apertures arranged in a circle, wherein each of said optical apertures corresponds to a unique sector of said circle and includes a blazed fiber Bragg grating that responds to selected wavelengths of light by radiating a radially directed light beam, said light beam being directable according to a specific wavelength of light chosen from said selected wavelengths of light; and

a source of multi-wavelength light operably coupled to said plurality of optical apertures.

2. The optical apparatus of claim 1 wherein each of said blazed fiber Bragg gratings are governed by the relation:

$$m\lambda = d\,(1 + \sin\phi)$$

where m = a whole number Bragg diffraction order, λ = wavelength of light in the fiber, d = a periodic grating spacing of index modulation in a core of the fiber, and ϕ is an exit angle of said radiated light beam wherein $\phi = 0$ is normal to a longitudinal axis of said fiber and further wherein said grating spacing d falls within a region $0.8\lambda < d < 1.2\lambda$.

3. The optical apparatus of claim 2 wherein said diffraction order is the fundamental m = 1.

4. The optical apparatus of claim 1 wherein said light beam is directable by expanding or contracting a radius of said blazed fiber Bragg grating.

5. The optical apparatus of claim 1 wherein said source of multi-wavelength light includes a laser.

6. The optical apparatus of claim 5 wherein said laser is one of a plurality of lasers.

7. An optical beam steering apparatus comprising:

a plurality of serially concatenated optical apertures arranged in a circle, wherein each of said optical apertures corresponds to a unique angular sector of said circle and includes a blazed fiber Bragg grating that responds to selected wavelengths of light by radiating a radially directed light beam, said light beam being directable according to a specific wavelength of light chosen from said selected wavelengths of light; and

a source of multi-wavelength light operably coupled to said plurality of optical apertures.

8. The optical beam steering apparatus of claim 7 wherein each of said blazed fiber Bragg gratings are governed by the relation:

$$m\lambda = d\,(1 + \sin\phi)$$

where m = a whole number Bragg diffraction order, λ = wavelength of light in the fiber, d = a periodic grating spacing of index modulation in a core of the fiber, and ϕ is an exit angle of said

radiated light beam wherein $\phi = 0$ is normal to a longitudinal axis of said fiber and further wherein said grating spacing d falls with a region $0.8\lambda < d < 1.2\lambda$.

9. The optical beam steering apparatus of claim 8 wherein said diffraction order is the fundamental $m = 1$.

10. The optical beam steering apparatus of claim 7 wherein said light beam is directable by expanding or contracting a radius of said blazed fiber Bragg grating.

11. The optical beam steering apparatus of claim 7 wherein said source of multi-wavelength light includes a laser.

12. The optical beam steering apparatus of claim 11 wherein said laser is one of a plurality of lasers.

13. An optical beam steering apparatus comprising:

a plurality of serially concatenated optical apertures arranged in a circle, wherein each of said optical apertures corresponds to a unique sector of said circle and includes a blazed fiber Bragg grating that responds to selected wavelengths of light by radiating a radially directed light beam, said light beam being directable according to a specific wavelength of light chosen from

said selected wavelengths of light and by expanding and contracting a radius of said blazed fiber Bragg grating; and

a source of multi-wavelength light operably coupled to said plurality of optical apertures.

14. The optical beam steering apparatus of claim 13 wherein each of said blazed fiber Bragg gratings are governed by the relation:

$$m\lambda = d\,(1 + \sin\phi)$$

where m = a whole number Bragg diffraction order, λ = wavelength of light in the fiber, d = a periodic grating spacing of index modulation in a core of the fiber, and ϕ is an exit angle of said radiated light beam wherein $\phi = 0$ is normal to a longitudinal axis of said fiber and further wherein said grating spacing d falls with a region $0.8\lambda < d < 1.2\lambda$.

15. The optical beam steering apparatus of claim 14 wherein said diffraction order is the fundamental m = 1.

16. The optical beam steering apparatus of claim 13 wherein said source of multi-wavelength light includes a laser.

17. The optical beam steering apparatus of claim 16 wherein said laser is one of a plurality of lasers.